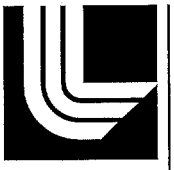

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NIF Programs Directorate Integrated Safety Management System Implementation Plan October 2000

L. Fischer

September 17, 2001

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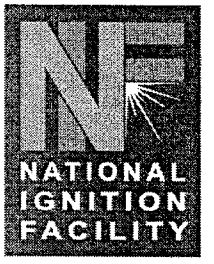
NIF Programs Directorate



Integrated Safety Management System Implementation Plan

October 2000

LAWRENCE LIVERMORE NATIONAL LABORATORY
University of California — Livermore, California — 94550

Integrated Safety Management provides important opportunities and advantages for the NIF Programs Directorate in the consistent and proper attention to safety essential in the conduct of the Laboratory's missions. This document describes a forward-looking and comprehensive institutional approach and set of requirements for operations and activities and for the implementation of the Integrated Safety Management System. A high level of attention to safety and performance is of prime importance to the success of the National Ignition Facility (NIF) Programs, the Laboratory, the University of California, and the Department of Energy.

George Miller
Associate Director for NIF Programs
Lawrence Livermore National Laboratory

Date

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1. INTRODUCTION

1.1 Directorate Commitment

Lawrence Livermore National Laboratory (LLNL) has developed a work structure that serves to ensure work is performed safely and in compliance with applicable environment, safety, and health (ES&H) requirements. Safety begins and ends with the worker "on the floor" conducting the work activity. The primary focus of the NIF Programs Integrated Safety Management System (ISMS) is to provide the worker with a sound work environment, necessary resources to perform the job, and adequate procedures and controls to ensure the work is performed safely. It is to this end that the ES&H roles, responsibilities, and authorities are developed and practiced.

NIF Programs recognizes and understands the Department of Energy (DOE)/University of California (UC) Contract requirements for ISMS at LLNL and the opportunities and values of the system. NIF Programs understands and supports the DOE Integrated Safety Management (ISM) objective, guiding principles, core functions, and the institutional requirements contained in the LLNL ISMS Description document. NIF Programs is committed to implementing and utilizing ISMS in all of its programs, operations, facilities, and activities and to continuing to assess its successful implementation and use.

1.2 Purpose and Content of This Document

NIF Programs ISMS has been developed consistent with the requirements of the LLNL *Integrated Safety Management System Description* document and specific ISMS implementation needs of NIF Programs. The purpose of this document is to define for NIF Programs' workers and communicate to both senior LLNL management and DOE how and where NIF Programs satisfies the institutional ISM requirements.

This document consists of:

- A NIF Programs document hierarchy that illustrates the flow of ES&H requirements from the directorate level to the worker.
- A roles, responsibilities, and authorities section for ES&H management chain positions.
- An ISM implementation matrix that references specific implementing documents for each of the ISM core functions and guiding principles.

1.3 Description of NIF Programs

NIF Programs includes the NIF Project and all of the directly supporting Research and Development required to assure its success. NIF Programs has two facilities under construction, the Laser Target Area Building (LTAB) and Optics Assembly Building (OAB), and 57 operating support facilities and development laboratories.

As shown in Figure 1, the NIF Programs Directorate can be divided into: (1) the design, construction, and activation of the NIF Project, and (2) the conduct of research/development and operations.

The NIF Program research/development and operations occur in 57 existing LLNL facilities. These facilities and operations comply with the institutional LLNL ES&H requirements as stated in the LLNL ES&H Manual.

The research/development and operations activities include completion of the science and technology development for demonstrating NIF performance goals and continuing research to improve its performance (e.g., computational codes and analysis, optical damage). Target development addresses technologies for fabricating and verifying NIF ignition targets (e.g., deposition processes). Diagnostic development is directed to supporting hydrodynamic experiments and studying fusion burn as NIF is activated, leading to full operation. Facility operations include experimental research/development areas, support areas (e.g., office, warehouse) and facilities as they are completed by the Project.

The NIF Project facilities consist of the NIF Project site and the corresponding laydown and construction support areas. The *Construction Safety Program* (CSP) for NIF is the governing ES&H document for work conducted for the NIF Project. The CSP requirements apply to all NIF contractors and subcontractors and LLNL and non-LLNL employees when working in these areas.

As the NIF Project facilities are brought to an operating facility status, work authorization will occur at key scheduled points through a series of management prestart reviews and culminating in DOE readiness assessments prior to first experiments and full test operation. As NIF becomes operational, it will transfer to compliance with the LLNL institutional ES&H requirements.

The NIF Project is implemented under a specific set of Work Smart Standards (WSS) in UC/DOE Contract 48. When the NIF Project enters the Operations stage, it comes under the LLNL Work Smart Standards also in UC/DOE Contract 48.

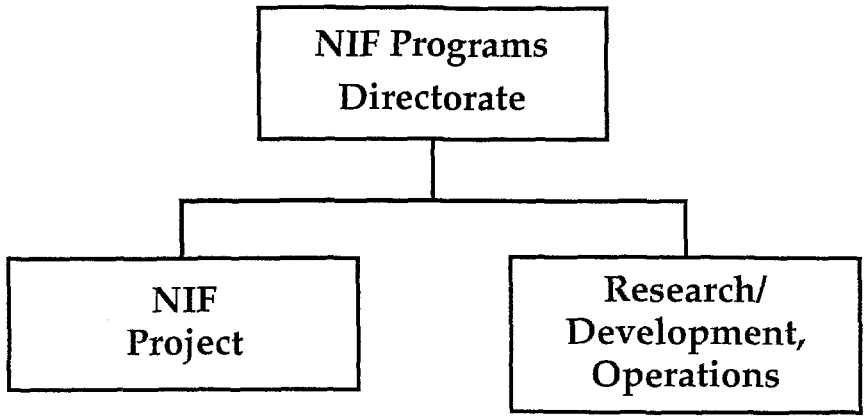

Figure 1. Major Elements of the NIF Programs Directorate.

2. DOCUMENT HIERARCHY

The requirements that provide the foundation for work at LLNL are contained in the WSS set in UC/DOE Contract 48. These come from many external sources [i.e., DOE, Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), etc.]. These requirements are tailored for work at LLNL and are contained in the LLNL *ES&H Manual* and other institutional documents. NIF Programs utilizes this set of institutional documents to develop and implement directorate-specific documents and procedures to further specify how it manages the work by NIF Programs employees. The NIF Project has its own specific WSS that is also in UC/DOE Contract 48. The NIF Project WSS set was established in April 1997 and predates the final LLNL WSS set put into place in August 1999. The NIF Project WSS are in force until the NIF Project reaches the operations stage, at which point it goes under the LLNL WSS. A team of DOE/NNSA and LLNL Hazards Control personnel have begun a gap analysis of NIF Project WSS vs institutional WSS to support the transfer to NIF operations.

This NIF Programs ISM System Implementation Plan is the overall guidance on the ISMS implementation within NIF Programs.

The *NIF Programs Directorate Quality Assurance Implementation Plan* also applies to all aspects of how work is performed, including ES&H, within the NIF Programs. The *NIF Programs Facility Management Plan for Environment, Safety, and Health* is the directorate-specific umbrella document that describes how safety is managed, including the work control system; roles, responsibilities, and authorities; and administrative ES&H programs. Other directorate-level management documents (training plan, emergency preparedness and response plan, self-assessment plan etc.) provide detailed guidance.

The next tier of NIF Program documents contains the implementing plans and procedures. These begin with the Safety Basis Envelope (SBE) documents that establish ES&H limits for each facility's Facility Authorization Level (FAL). SBE documents may include the *Hazards Analysis Report* (HAR), the *Facility Screening Report* (SCR) *Process Hazards Analysis* (PHA), the *Preliminary Safety Analysis Report* (PSAR) and/or the *Safety Analysis Report* (SAR). Other safety documents that implement the controls for the hazards identified in the SBE documents include the Facility Safety Plans (FSPs), the Operational Safety Plans (OSPs), Integration Worksheet (IWSs), and the NIF CSP.

The NIF Project has a full set of documents that are consistent with and subordinate to the Directorate documents (see Figure 2). NIF Project has a Quality Assurance (QA) Program Plan (*NIF Programs Directorate Quality Assurance Implementation Plan*) and a full set of implementing project procedures (*NIF Project Control Manual*). The Project has a National Environmental Protection Act (NEPA) determination (*Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*) and environmental permits, mitigation action plan

(*NIF Mitigation Action Plan*) and a waste minimalization/pollution prevention plan (*NIF Pollution Prevention and Waste Minimization Plan*). Safety documents include a PHA, PSAR, FHA, and draft FSAR for the LTAB and a HAR for the OAB. Construction safety is under the CSP and lower-tier safety plans. As the NIF is brought to an operating facility status, work authorization will occur at key scheduled points through a series of management prestart reviews culminating in DOE readiness assessments prior to first experiments and full test operation. When NIF becomes operational, it will have Operational Safety Requirements (OSRs), FSPs, and OSPs, completing the SBE.

The hierarchy of the NIF Programs and the NIF Project documents is shown in Figure 2. More detailed information on these documents is provided in Attachment 1.

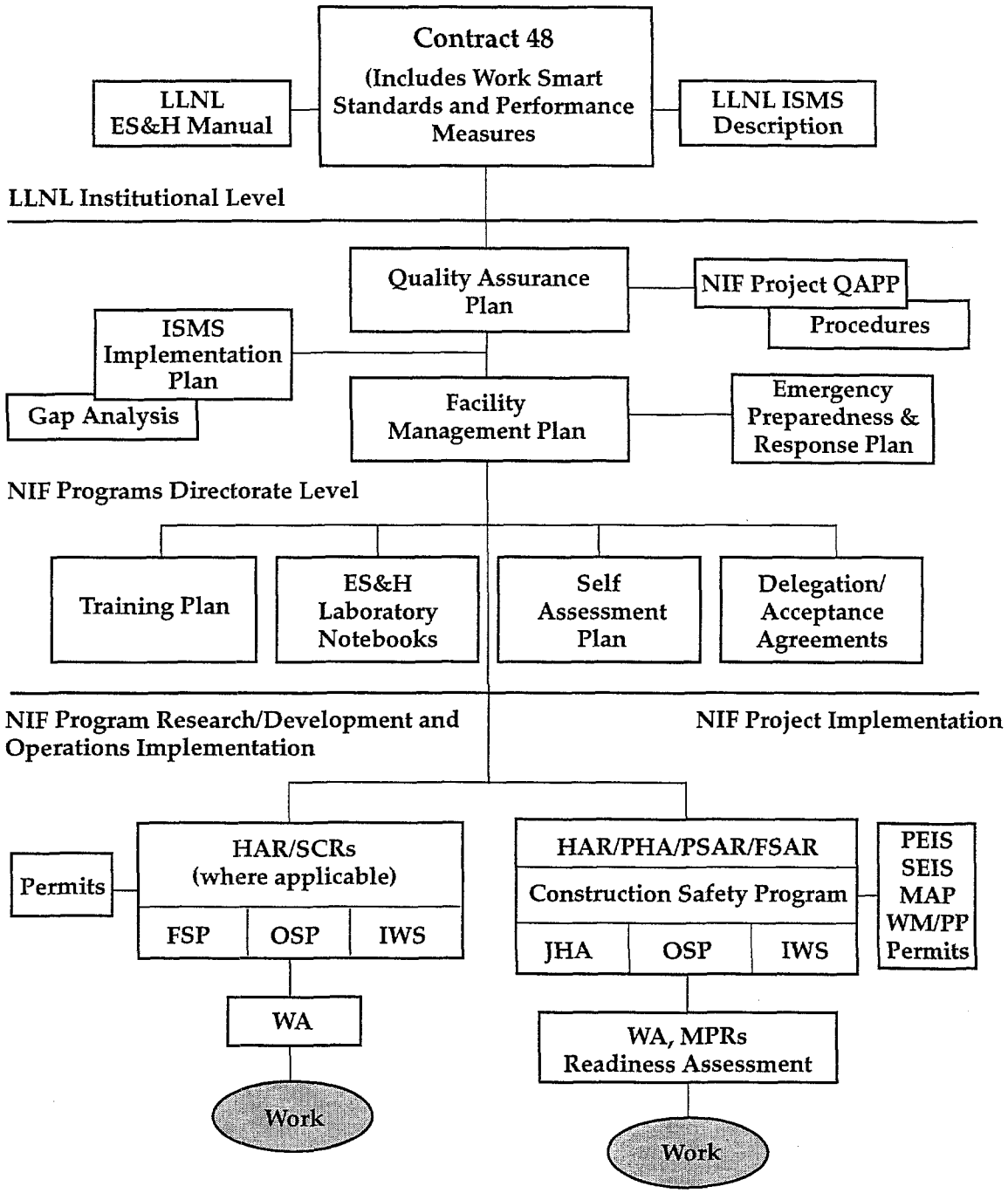

Figure 2. NIF Programs document hierarchy.

3. ES&H Roles, Responsibilities, and Authorities

The NIF Programs focus in managing ES&H is at the worker level (the box "Worker" in Figure 3). The ES&H management chain and associated ES&H responsibilities flow up from each worker to the highest level of management in a clearly defined path for accountability.

NIF Programs is responsible for the management of facilities, a variety of technical projects, and for personnel on its payroll accounts. Consequently, the NIF Programs Associate Director (AD) functions as a "Program" AD, Facility AD, and Payroll AD. The AD fulfills ES&H responsibilities through delegation of authority to the Deputy Associate Directors (DADs) and Program Leaders/Project Manager (PLs/PM) as Authorizing Individuals within their management chain. Unless prohibited, Authorizing Individuals (AIs) may delegate authority to execute responsibilities within their management chain. An Assurance Manager (AM), appointed by the NIF Programs AD, assesses the implementation of ES&H requirements for the AD and is independent from the programmatic, facility, and payroll lines of responsibility in ES&H implementation activities. This management structure is illustrated in Figure 3.

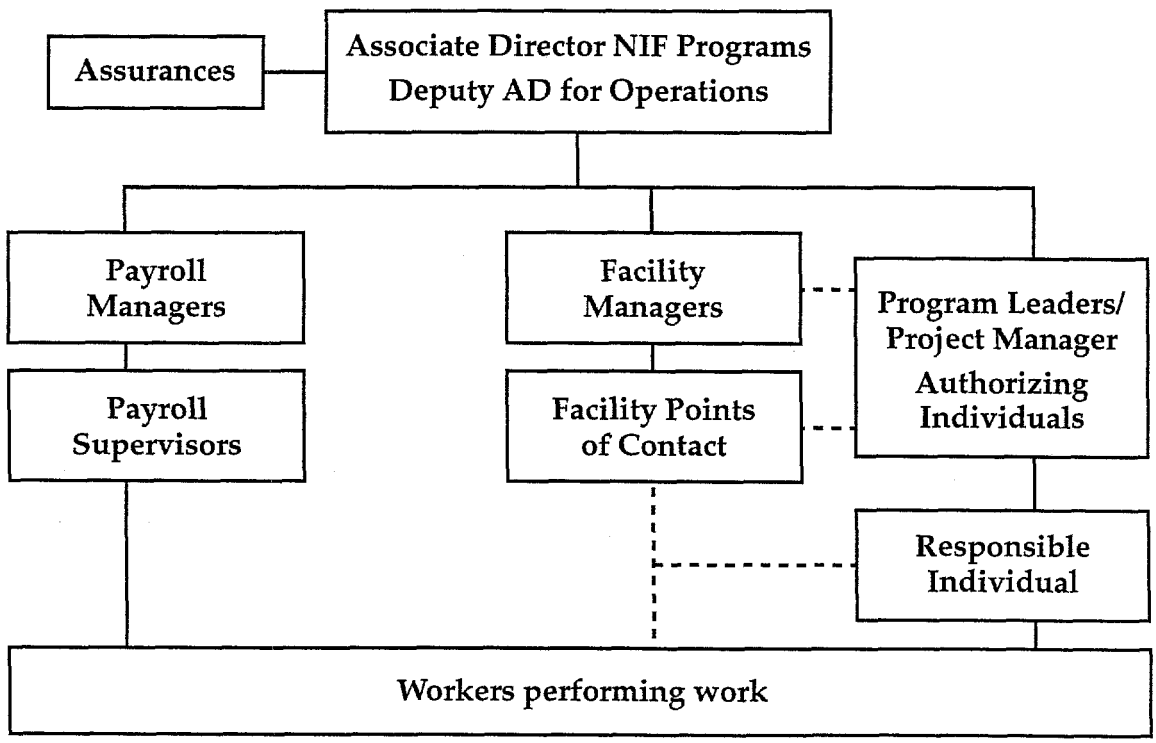

Figure 3. The NIF Program ES&H management structure.

A detailed description of ES&H responsibilities is contained in the *NIF Programs Facility Management Plan for Environmental Safety and Health.* The following sections summarize the main responsibilities from that Plan.

3.1 Associate Director

The NIF Programs AD reports to the Director of the Laboratory and is responsible for:

- Acquiring and allocating resources (money, time, space, equipment, and qualified personnel) to assure that the Directorate meets its programmatic and ES&H obligations.
- Ensuring ES&H planning takes place for all NIF Programs activities (i.e., programmatic/technical work and facility-related activities).
- Ensuring hazards associated with NIF Programs-managed activities are analyzed and appropriate ES&H controls are implemented to reduce the risks of NIF Programs activities to an acceptable level before NIF Programs work activities are authorized.
- Ensuring personnel supporting NIF Programs activities perform their work safely and in compliance with applicable requirements and are involved in all aspects of the work planning process.
- Maintaining a self-assessment program to obtain feedback on the effectiveness of the ES&H controls and their use and incorporating lessons learned into Directorate work activities.
- Approving Directorate-level ES&H plans and procedures, occurrence reports, ES&H Self Assessment plans, and other ES&H documents.
- Ensuring that a QA Program is established and implemented on a graded approach.
- Acting as Facility AD for NIF Programs and appointing Facility Point of Contacts (FPOCs), Facility Managers, and ES&H Assurance Manager to assure that work managed by the Directorate is in accordance with applicable ES&H requirements.
- Designating the management level(s) with authorization to conduct the various reviews and to authorize work.
- Ensuring that serious ES&H related incidents and near misses are reported to the DOE and that formal reviews, including root cause analyses, are conducted and addressed consistent with the provisions of the ES&H Manuals.

- Ensuring appropriate Directorate training program is implemented and maintained including facility-specific training requirements.

To efficiently manage these responsibilities, the NIF Programs AD has appointed senior managers to manage each of these issues within their respective management chain. Table 1 summarizes this delegation of authority.

Table 1. Summary of AD authority delegation.

Management chain	Appointed individuals(s)
NIF Programs	Program Leaders, and NIF Project Manager
NIF Programs facilities	DAD for Operations
NIF Programs payroll	DADs and Program Leaders and NIF Project Manager

3.2 Deputy Associate Director for Operations

The DAD/Ops has oversight and management responsibility for all NIF Programs facility staff operations, facility services, and information systems. The NIF Programs AD has delegated AD Facility Manager responsibilities to the NIF Programs DAD/Ops. The DAD/Ops ensures implementation of ES&H requirements and oversees administrative issues throughout the DAD/Ops management chair. This includes ensuring implementation and compliance with all facility-related ES&H requirements, including those associated with Integrated Safety Management; conduct of operations, and concurrence on facility-related Memoranda of Understanding (MOUs).

The DAD/Ops is responsible to:

- Represent the interests of NIF Programs in Institutional operations and facility issues.
- Ensure appropriate metrics are developed and used to track, trend, evaluate, and improve safety performance. Based on the information derived from the various performance monitoring and feedback processes, appropriate improvements are to be incorporated into the NIF Programs implementation of the LLNL ISMS or the *ES&H Manual*, as appropriate.
- Establish and maintain safety programs as required (e.g., the Accident/Injury Prevention program, ergonomics, beryllium, Pollution Prevention).
- Ensure the NIF Programs implementation of the LLNL ISMS is sustained and controlled incorporating feedback and improvement from the annual ISMS reviews. Address unique issues or special cases not articulated by the LLNL *ISMS Description* or the NIF Programs *ISMS Implementation Plan.*

- Develop and improve the Directorate's ES&H/Operational policies and processes.
- Ensure NIF Programs readiness for emergency response/self-help.

The DAD/Ops has delegated authority for executing facility responsibilities to the AD Facility Manager.

3.2.1 AD Facility Manager

AD Facility Manager is responsible for the following ES&H related activities:

- Ensuring the NIF Programs facilities are operated and maintained in a safe and efficient manner, and that appropriate facility records are maintained.
- Advising Directorate Management on facility issues and recommending actions including, but not limited to, facility renovation and consolidation.
- Representing the Directorate on the Site Planning and Capital Assets Management Working Group and being responsible for interactions with space and site planning and the Institutional Facility Manager's Office.
- Assuring that workers working within the facility comply with facility-specific requirements, including training requirements.
- Participating in the self-assessment plan for the facility and ensuring that the necessary corrective actions are taken.
- Reviewing ES&H IWSs (see HSM C2 of the *ES&H Manual*) for compliance with facility related requirements, (e.g., those in the *ES&H Manual*, FSPs, Technical Safety Requirements, OSPs) and ensuring compatibility between different operations within a given facility.
- Ensuring that proposed operational or activity changes are evaluated against the facility's existing ES&H documentation (e.g., the authorization basis).
- Communicating facility-related ES&H requirements to building residents and visitors, as appropriate.
- Developing MOUs between NIF Programs facility management and support organizations when necessary to ensure ES&H requirements are met for facility-related work activities.

3.2.2 Facility Points of Contact

FPOCs are responsible for, and oversee, the operation of NIF Program facilities to ensure proper and efficient operation. They ensure that facility-related ES&H requirements are properly implemented in NIF Programs facilities. FPOCs are appointed by the Facility AD.

Specific responsibilities for NIF Programs FPOCs include:

- Acting as the interface between personnel who will be working in the facility and facility management.
- Concurring on the IWS that the work can be safely performed in the facility.
- Evaluating proposed operational or activity changes against the facility's existing ES&H documentation (e.g., authorization basis).
- Ensuring facility safety equipment functions as intended.
- Identifying hazards associated with the work location and communication them to the responsible work management chain.
- Establishing and appropriately communicating to facility residents and the responsible management chain any facility controls and special conditions, including unacceptable collateral effects that might be associated with the proposed work.
- Coordinating utility and building system shutdowns with building occupants to ensure that ongoing operations are not unduly disrupted.
- Participating in the prestart review of the work, when one is conducted.

3.3 Program Leaders and Project Manager

The AD has delegated the authority for fulfilling NIF programmatic (technical) and payroll (administrative) ES&H requirements to the PLs/PM. PLs/PM are the AIs for NIF Programs activities managed by their management chain. They may delegate this responsibility to their Group Leaders.

The PLs/PM have the following responsibilities:

- Balancing the management of ES&H issues with project concerns (e.g., deliverables, milestones), other work in progress, and the risks associated with the new activity. ES&H costs need to be included in the budget and adjusted to ensure safety considerations are met, particularly if there is a short time schedule for completing the work. Sufficient resources, including qualified

people, space, equipment, time and funds, need to be allocated for engineering design and maintenance of equipment and systems.

- Ensuring that LLNL facilities are operated and maintained in a safe and efficient manner. Ensure that the hazards associated with the work activity are analyzed and controlled, consistent with ISM and the provisions of the *ES&H Manual*, with input from the ES&H Team and the employees who will be working on the project.
- Allocating resources for work activities. Ensure that adequate funding, time, and resources are available for ES&H-related requirements associated with the work.
- Monitoring their work areas and activities; periodically reviewing the hazards, adequacy, and effectiveness of controls; soliciting worker feedback on safety; and implementing improvement as appropriate.
- Preparing FSPs, reviewing and concurring with the approval of OSPs, and implementing facility-related requirements specified in IWSs, OSPs, FSPs, and the Laboratory *ES&H Manual.*
- Assuring that workers working within the facility comply with facility-specific requirements, including training requirements.
- Participating in the self-assessment plan for the facility and ensuring that the necessary corrective actions are taken.
- Ensuring that applicable Lessons Learned are considered for feedback and improvement during the process of authorizing work and during self-assessments.
- Participating in incident analysis and occurrence reporting activities.
- Maintaining key records as necessary to ensure the proper management of programmatic ES&H issues.
- Ensuring that Management Prestart Reviews are implemented for work authorization.
- Ensuring that the NIF Programs Quality Assurance Plan is implemented.

In addition, the NIF Project Manager has the following responsibilities:

- Approving the NIF Construction Safety Program.

- Managing the implementation of the NIF Construction Safety Program, assuming that subordinate contractor safety plans are prepared in addition to Job Hazards Analysis and Safe Plans of Action to control construction safety activities.

3.4 Responsible Individuals

The NIF PLs, NIF PM and the DAD/OPS have delegated the authority for fulfilling the following ES&H responsibilities to personnel that have been appointed as Responsible Individuals (RIs). RIs are responsible for the work and personnel in their designated areas. They are knowledgable of the hazards that exist in their areas and monitor activities to verify that the controls required by the FSP, OSP, IWS to mitigate hazards are implemented. As appropriate, the RI works with the PL/PM or FPOC and the ES&H Team to identify and correct program- and room-related ES&H deficiencies. RIs include people given various titles in NIF Programs, such as Principal Investigator, Project Leader, Area Manager. Task Leader, Lead Scientist, Lead Operator, and other such titles.

RIs have the following responsibilities:

- Initiating the IWS process for all new or modified activities under their responsibility.
- Identifying the various skills, knowledge, abilities, and the qualification requirements, including training and medical certifications (if any), for performing the work activity.
- Identifying the individuals with the qualifications and training necessary to perform the work.
- Ensuring that the personnel supporting their activities have the required safety training, including specific facility training, or that they work under the direct supervision of a trained individual.
- Ensuring that roles, responsibilities, and authorities of personnel performing the work are clearly defined and making that information readily accessible to others.
- Ensuring that requirements necessary to carry out the work are identified and communicated to those performing the work. This includes taking steps to ensure that each worker is knowledgeable of the governing procedures, including required operating limits and work controls.
- Ensuring that the training necessary to do the assigned work is identified and communicated to the Payroll organization.

- Ensuring that the specific hazards for the work are clearly communicated to the staff involved in the activity.
- Ensuring that tailored controls (including the appropriate incorporation of engineered and administrative controls) are developed and implemented for each hazard associated with the work activity consistent with the requirements in the *ES&H Manual*, CSP, and applicable WSSs with input from subject-matter experts.
- Ensuring that workers have immediate access to the work activity's governing procedures and safety documents.
- Ensuring that work is performed in accordance with the safety controls specified as part of the work authorization process.
- Signing or ensuring that qualified personnel sign hazardous waste requisitions for hazardous waste generated by the work activity.
- Signing or ensuring that qualified personnel sign hazardous materials shipping forms when these materials must be shipped by the work activity.
- Monitoring the work activity to ensure that the governing procedures and safety documents are being followed, and, as appropriate, strengthening the work activity's safety performance.
- Periodically reviewing the hazards and the adequacy of the controls for the work activity and the effectiveness of engineered and administrative controls incorporated.
- Suspending affected parts of operations when the approved work activity authorization or the facility operations authorization has been exceeded, the operating limits and/or controls are not being followed, or when observation indicates that people, property, or the environment are in danger of being hurt or damaged. The work shall be suspended until appropriate remedial actions are taken.
- Contributing feedback and lessons learned to their ES&H Assurance Manager.
- Ensuring that their employees participate in the ES&H planning before the work is authorized to begin.

3.5 Employee Responsibilities

Each employee, including those individuals discussed in the management sections of this document, is responsible for the following:

Maintaining his or her own safety.

- Knowing the ES&H plans, controls, and requirements of their assignments and the potential hazards, and emergency plans and procedures for the work area.
- Successfully completing all required training and, if applicable, participating in personnel assurance programs ("Personnel Assurance Program" (H&SM S1.14), and "Personnel Security Assurance Program" (H&SM S1.15) in volume I of the *ES&H Manual*), and health monitoring programs.
- Performing work assignments in accordance with requirements listed in the Laboratory's *ES&H Manual* and established safety plans and procedures. Workers are only to perform work for which they are trained or qualified.
- Only performing work that has been authorized. Note that work commonly performed by the public (see "Glossary of ES&H Terms" in Volume I of the *ES&H Manual*) may be self-authorized, so long as all applicable controls are followed.
- Immediately correcting or informing the responsible manager of ES&H-related problems. If a satisfactory response is not received, then the senior manager for the organization should be contacted, and then the Laboratory Site Manager.
- Warning fellow workers and visitors of hazards and defective equipment.
- Requesting that work be stopped if it is observed that an operation presents an imminent or substantial danger to health, safety, or the environment. Each worker is empowered to stop his own work if there is an unsafe or unapproved condition.
- Reporting work-related injuries and illnesses to their supervisors and to Health Services.
- Keeping their exposures to radiation, toxic materials, and other hazardous materials as low as reasonably achievable.
- Consulting their managers for guidance when they are uncertain about any ES&H-related work requirements.
- Bringing to the attention of their supervisors and RI's opportunities for improvement associated with the work or governing procedures.

Consistent with Chapter 2 of LLNL's *ES&H Manual,* employees are authorized to undertake activities commonly performed by the public, without formal review by others, once they have confirmed applicable requirements have been met and the activity can proceed safely. In no instance shall an individual perform a work activity not commonly performed by the public without approval of the appropriate person in the authorization chain.

3.6 Assurance Manager

The AM is responsible for independent oversight of ES&H activities within the Directorate. The AM serves as the Directorate point of contact for ES&H-related audits and inspections; drafts directorate ES&H policy, plans, and procedures for the AD's approval; and advises NIF Programs personnel on ES&H compliance issues. The AM also provides guidance on methods for effectively implementing these requirements in the form of formal and informal appraisals, audits, facility walk-throughs, reviews of facility and program ES&H and QA plans and procedures, ES&H workshops, and other forms of communication.

The AM also has responsibility to:

- Serve as NIF Programs representative on the LLNL ES&H Working Group to address and resolve institutional and cross-directorate ES&H policy issues and participate in facilitating the safety performance measure process.
- Act as the point of contact for audits performed by the LLNL Assurance Review Office and other auditing agents external to NIF Programs.
- Review and concur in the approval of policies, plans, programs, and practices developed in NIF Programs, including those outside the Assurance Office that pertain to meeting ES&H requirements.
- Assess the implementation of ISM within the Directorate.
- Track and determine trends regarding safety-related issues found in self-assessments, occurrence reports, and incident analyses pertaining to the NIF Programs Directorate.
- Track the completion of identified deficiencies and validate the close-out of those deficiencies with potentially significant ES&H consequences.
- Determine the reportability of occurrences within NIF Program facilities and coordinate the occurrence reporting within NIF Programs.
- Maintain archival ES&H files pertaining to audits and appraisals of NIF Programs.
- Administer the NIF Programs Lessons Learned Program.

- Support the Contract 48 ES&H Performance Measure Process by either providing or coordinating the input data for the Performance Measures, and integrating it into the Directorate's safety performance metrics.

Advise line managers and work supervisors of changes to institutional ES&H requirements and guidance and suggest implementation options.

3.7 ES&H Support

NIF Programs is supported by the ES&H support departments, which include Hazards Control (HC), Environmental Protection Department (EPD), and Health Services. Additional ES&H support is provided by the Risk Management Office, Plant Engineering, and Mechanical and Electronics Engineering.

3.7.1 ES&H Teams

ES&H Teams are assigned to coordinate ES&H services for activities within the various LLNL facilities. ES&H Team 2 supports activities in NIF Programs facilities. NIF Programs personnel working in non-NIF Programs facilities are supported by the ES&H Team assigned to that facility unless specified differently by a signed MOU.

The ES&H Team provides guidance to experimenters and other personnel on safety issues in the workplace. ES&H Team activities include the following:

- Monitoring activities to help management and employees maintain a minimal-risk work environment.
- Assisting in the processing of, reviewing, and concurence of all FSPs, OSPs, IWSs, and other safety analysis documents. This includes providing input on the identification of special controls needed to address issues not covered by LLNL's *ES&H Manual.*
- Assisting with emergency response to accidents, fires, spills, and other incidents.
- Notifying the NIF Programs management of unusual ES&H-related risks associated with NIF Programs activities.
- Providing NIF Programs with injury, illness, and chemical/radiation dose information for employees in the Directorate.
- Coordinating support from HC, the EPD, and Health Services.

3.7.2 Environmental Protection Department

The EPD provides support to experiments and other personnel on:

- Obtaining necessary environmental permits and supporting regulatory agency reviews of permit compliance.
- Assisting with emergency response to accidents fires, spills and other incidents.
- Preparing NEPA documentation for new and/or modified activities.
- Preparing preconstruction soil and biological surveys.
- Completing any potential CERCLA-related activities.
- Handling hazardous and radioactive waste generated in NIF Programs facilities at LLNL.

3.7.3 Plant Engineering

Plant Engineering (PE) supports NIF Programs in the maintenance of its facilities. While NIF Programs retains responsibility for the facilities, PE has the authority, *with facility management concurrence,* to maintain and service mechanical, electrical, and structural components necessary for the safety and environmental soundness of the buildings. PE is responsible for the safe execution of PE work in NIF Programs facilities, including required training and supervision of PE personnel. NIF Programs is responsible for informing PE of hazards associated with NIF Programs activities that may impact the performance of specific maintenance activities.

All PE work that affects NIF Programs facilities must be coordinated through the appropriate FPOC.

3.7.4 Mechanical Engineering

NIF Programs uses support from Mechanical Engineering (ME) to assure the safe operation and design of both facility and programmatic equipment. Their responsibilities are to:

- Design, implement, or evaluate the seismic stability of equipment and system components.
- Prepare, review, and approve Engineering Safety Notes.
- Design, implement, and/or evaluate the selection, fabrication, installation, operation, and maintenance of mechanical, vacuum, and pressure equipment for safety hazards.

- Perform acceptance inspections of new equipment or inspection and recertification of older equipment on request.
- Identify when special engineering issues need to be addressed.
- Review IWSs/OSPs for Mechanical Safety and personnel controls, on request.
- Participate in periodic inspections or reviews of NIF Programs equipment and activities.

3.7.5 Electronics Engineering

NIF Programs uses support from Electronics Engineering to assure the safe operation and design of both facility and programmatic equipment. Their responsibilities are to:

- Evaluate the safety of the design, selection, fabrication, installation, operation, and maintenance of electrical equipment and electronic controls and interlocks which protect personnel and equipment.
- Perform acceptance inspections of new equipment or inspection and recertification of older equipment on request.
- Review IWSs, OSPs, and FSPs for electrical safety and personnel controls, upon request.
- Participate in periodic inspections of NIF Programs activities and operations, including interlock checks, checks of alarm systems, and review of electrical distribution.

3.8 Tenant Responsibilities

All programs and personnel, both NIF Programs and non-NIF Programs, that operate in NIF Programs facilities are responsible for meeting the overall facility ES&H plans and for ensuring that their activities are conducted safely. *Tenants must seek FPOC concurrence in all ES&H issues that may directly or indirectly impact the facility or other activities in that facility.* This includes modification to the facility and facility systems, changes in hazardous chemical inventory, or the use of radionuclides that may impact the safety classification of the facility.

Prior to terminating work in NIF Programs facilities, either by the project as a whole or by personnel supporting that project, the Laboratory/Office Transfer Form must be completed and approved. If necessary, decommissioning and decontamination plans will be developed and implemented. Costs of cleaning up materials, waste, or other safety or environmental hazards will be borne or secured by the project.

3.9 Off-Site Operations

All NIF Programs employees are trained in the Five Functions and Seven Principles of ISMS, and as such, are directed to apply them for all work to be done off site.

NIF Programs safety for Off-Site Operations is evaluated using the IWS process and governed by one of the following:

- An OSP specifically generated for the operation to be conducted per LLNL ES&H Manual.
- The safety umbrella of the facility where the work is to be performed. If it is determined that this safety guidance is inadequate for the work being performed, an OSP will be developed to provide the safety guidance.

3.10 Work Authorization

For the purpose of ES&H, a NIF Program is one that either has a NIF Programs or Project cost center, is being performed under an IWS or OSP approved by NIF Programs, or is under an MOU. AIs act as the final check and balance in authorizing work. AIs are to ensure that hazards are appropriately analyzed, appropriate controls are in place, and that adequate resources exist for the project scope including cleanup and closeout. For NIF Programs work, AIs use the IWS to review and authorize work.

Responsibilities for AIs are listed in Section 3.3.

The NIF Project formal work authorization process utilizes a sequence of Management Prestart Reviews and Readiness Assessments to ensure readiness to proceed before the AI approves proceeding to the next phase of work

3.11 Major Delegation/Acceptance Agreements and Special Hazard

As necessary, NIF Programs will develop delegation/acceptance agreements both inside NIF Programs and with other directorates. NIF Programs does not have any special hazards (i.e., outside the WSS set).

4. TRAINING

Implementation of ISMS at LLNL requires effective communications integrated across the Laboratory as well as appropriate training so all employees and managers are familiar with the Fundamental and Guiding Principles, the Core Functions, and how they relate to their everyday work. NIF Programs participated in institution-wide activities associated with the communication and training of ISM.

Additionally, NIF Programs will execute its own internal communication and training program. The intent of this program is (1) to initiate an awareness and understanding of ISM and its specific implementation within NIF Programs and (2) to establish forums and other communication vehicles for feedback and improvement. Key elements of the ongoing communication and training efforts will be the responsibility of the NIF Operations Manager, NIF Training Coordinator, and managers and supervisors, thereby involving all NIF Programs employees in continuing discussions, dissemination of information, raising and addressing safety issues, and participating in safety awards program.

The NIF Programs Training Plan establishes the policies and assigns responsibilities for the management and conduct of training activities in the Directorate. This training plan is consistent with the *LLNL Training Program Manual* and applies to the research, technology development, and deployment activities of all programmatic elements under the direction of the AD for NIF Programs, as well as all visitors and personnel who support operations within the programs.

5. FEEDBACK AND IMPROVEMENT

5.1 Lessons Learned Program

Lessons Learned are prepared whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience or product. Workers are encouraged to share and incorporate Lessons Learned during the course of the work planning, hazards analysis, development of controls, and/or doing work. Lessons Learned are distributed, as applicable, through the Lessons Learned program. The NIF AM is the directorate point of contact for information regarding Lessons Learned. The AM provides input to the institutional Lessons Learned Office and receives DOE Complex-wide Lessons Learned for distribution to NIF Programs personnel. The AM ensures that each facility and the Project receives all applicable Lessons Learned.

5.2 Self-assessments

Self-Assessments are audits, inspections, or assessments initiated from within NIF Programs. They play a key role in the process of feedback and improvement. Managers and supervisors are required to periodically walk through their area on either a formal or informal basis, to assess operations and conditions. There is no requirement for informal assessments to be documented, however the Laboratory's DefTrack system may be used to track deficiencies.

5.3 Performance Measures

Consistent with Section 6.7.1.3 of the LLNL ISMS Description, NIF Programs contributes to the institutional performance objective, criteria and measures. The NIF Programs AD will monitor the NIF Programs performance in environment, safety, and health including the Programs contribution to institutional measures.

5.4 Incident Analysis/Root Cause Analysis

The AD is responsible for appointing an incident analysis (IA) committee to evaluate serious incidents and near misses. The IA committee conducts the review in accordance with Chapter 4 and Supplement 4.08 of the *ES&H Manual*. All formal incident analyses, and any reportable occurrence where the root cause is not readily apparent, shall be subject to a formal Root Cause Analysis by a team of individuals trained in the process. In addition, results of trend analyses or other findings will be subjected to the process when deemed appropriate by NIF Programs management. Corrective actions resulting from the Root Cause Analyses are tracked to closure in DefTrack.

6. NIF PROGRAMS ES&H BUDGET PROCESS

To develop the NIF Programs ES&H and Assurance Office budget the following steps are carried out:

- Information is gathered from the Assurance Office to determine their needs for the upcoming year based on anticipation requirements and performance.
- A review of the past ES&H and Assurance Office budgets are viewed against past and present requirements.
- Any changes in programmatic size and funding levels are factored in.
- Identified needs are translated into dollars at the appropriate salary and burden rates.
- The proposed budget, based on agreed requirements and performance, is submitted to the AD for review and approval.
- The total budget package is submitted to Finance for review and approval.
- Once approved the budget is set and distributed.

The AM is given a monthly update on current spending for the Assurance Office budget. Should any special needs arise throughout the budget year that were not identified in budget preparation, the AM informs the DAD/Ops, who reviews the request and makes the appropriate allocations.

Additionally, each Program has allocated resources through their budgets for individuals that are responsible for ES&H. These individuals may work either full or part-time on ES&H depending on the size of the program. The major *activities (Final Safety Analysis Report, Programmtic Environmental Impact Statement,* etc.) in the NIF Project are line items in the NIF Project Data Sheet. The NIF Project annual assurance budget is allocated through the cost account plan process.

7. DIRECTORATE IMPLEMENTATION

7.1 Requirements Matrix

NIF Programs ISMS Implementation Matrix (see Attachment 1) lists where each of the defined institutional ISMS requirements is implemented both institutionally and within NIF Programs. Table 3 describes the layout of the matrix. Section 6 of the matrix is the core requirements.

Table 3. Structure of NIF Programs ISM Implementation Matrix. The NIF Project ISM implementation matrix is attached as an example of lower tier implementation

Column	Description of contents
1st	Reference.
2nd	Institutional ISM requirements.
3rd	The specific institutional source document reference that satisfies the institutional ISM requirement.
4th	The specific NIF Programs management document reference that satisfies the institutional ISM requirement.
5th	Comments.
6th	The position within NIF Programs that is responsible for satisfying the institutional requirement.

At the top of the matrix is a definition section of the various acronyms used in the matrix.

The NIF Project has a subordinate ISM matrix that is contained in NIF Project Policy 1.11. This matrix shows how NIF documents and processes carry out the 5 Core Functions and 7 Guiding Principles.

7.2 Institutional Connection

To facilitate the connection to utilization of Institutional functions by the Directorate, NIF Programs uses *Overview of Institutional Roles, Responsibilities and Function*, August 11, 2000 (PP0-AM-00-06, Version 2).

8. ACRONYMS

AD	Associate Director
AI	Authorizing Individual
AM	Assurance Manager
CSP	Construction Safety Program
DAD	Deputy Associate Director
DAD/Ops	Deputy Associate Director for Operations
DDO	Deputy Director for Operations
DOE	Department of Energy
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
ES&H	Environment, Safety, and Health
FAL	Facility Authorization Level
FMP	Facility Management Plan
FPOC	Facility Points of Contact
FSP	Facility Safety Procedure (Plan)
HAR	Hazards Analysis Report
HEDES	High Energy Density Experimental Science
HC	Hazards Control
HVAC	Heating, Ventilation, Air Conditioning
HWM	Hazardous Waste Management
IA	Incident Analysis
ICF	Inertial Confinement Fusion
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
IWS	Integrated Work Sheet
LE	Lead Experimenter
LLNL	Lawrence Livermore National Laboratory
LTAB	Laser Target Area Building
ME	Mechanical Engineering
MOU	Memoranda of Understanding
NEPA	National Environmental Policy Act
NIF	National Ignition Facility
OAB	Optics Assembly Building
OSHA	Occupational Safety and Health Administration
OSP	Operational Safety Plan
OSR	Operational Safety Requirements
PE	Plant Engineering
PHA	Process Hazards Analysis
PL	Program Leader
PM	Project Manager
POC	Point of Contact
PSAR	Preliminary Safety Analysis Report

QA	Quality Assurance
RI	Responsible Individual
SAD	Safety Analysis Document
SAR	Safety Analysis Report
SBE	Safety Basis Envelope
SCR	Facility Screening Report
UC	University of California
WA	Work Authorization
WSS	Work Smart Standards

9. REFERENCES

9.1 Institutional Documents

UCRL-AR-132791, *Integrated Safety Management System Description*, Lawrence Livermore National Laboratory, Version 3.0, February 14, 2000.

Lawrence Livermore National Laboratory ES&H Manual
http://lllnl.gov/llnl_only/es-and-h/hsm/llnl_hc.shtml

UCRL-MA-106166, *Lawrence Livermore National Laboratory Training Program Manual.*

LLNL Lessons Learned
http://www-r.llnl.gov/es/and_h/lessons/lessons.shtml

9.2 NIF Programs Directorate Documents

NIF Programs Directorate Quality Assurance Implementation Plan (NIF-0054117).

NIF Programs Facility Management Plan for Environment, Safety, and Health (NIF-0053679).

NIF Programs ES&H Self-Assessment Program Plan (draft).

NIF Programs Training Plan (draft).

NIF Programs ISM Reference Guide (draft).

NIF Programs Emergency Procedures and Response Plan (draft).

NIF-0001321-0D, NIF Project Construction Safety Program, October, 2000.

NIF-00044165-0Q, NIF Project Control Manual, Rev. 16, August 4, 2000.

NIF Mitigation Action Plan, January 1997.

NIF-0010575, NIF Pollution Prevention and Waste Minimization Plan, September 1, 1998.

NIF-0034583, NIF Preliminary Safety Analyses Report, September 30, 1996.

9.3 United States Department of Energy Document

Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management, *Volume III, United States Department of Energy, September 1996.*

10. REVIEW INTERVAL

To ensure maintenance and configuration control, an annual review of this Implementation Plan is conducted to incorporate any substantive changes resulting from updates to the LLNL ISMS Descriptions and/or management system requirements in the LLNL *ES&H Manual.*

ATTACHMENT 1.
REQUIREMENTS MATRIX